PASIG MONTHLY CITATION BLAST: No.89 December 2013

Dear Performing Arts SIG members:

It's time to book your flight, hotel and conference! CSM is around the corner, and this year we are in Las Vegas. The website information for the conference is up, take a look:

http://www.apta.org/csm/

CSM 2014 PASIG programming in Las Vegas: Wednesday, February 5th
"A multidisciplinary approach in caring for the acrobatic athlete in the performing arts."
The speakers are:
Kerry Gordon, MS, ATC, CMT, CSCS, PES
Steve McCauley, ATC, CSCS
Chad Hason, MD
Tiffney Touton, PT, DPT, LAT, ATC, CSCS
Frank Perez, ATC

They will present on behind the scenes care of performers, epidemiology of injuries, assessments of hypermobile performers and management of hip and shoulder pathologies.

Remember, the PASIG business meeting follows immediately after the presentations, and all PASIG members, including students, are welcome to join! If you have research ideas or any ideas you would like to discuss at the meeting, or would like to meet with me about at CSM over coffee, please email me soon. I truly hope to see you there! **PASIG membership is free to all orthopaedic section members,** so please join us.

This month's citation blast is on *"New Considerations for Performing Arts Physical Therapists in a Direct Access Environment"* with a bend toward evaluating medical apps.

The practice of compiling abstracts has been an easy way for interns and clinicians to provide content for a citation blast as well as prepare for a clinical inservice or case study report. Please consider compiling Performing Arts-related abstracts for a citation blast this year. It's easy to do, and a great way to become involved with PASIG! Just take a look at our Performing Arts Citations and Endnotes, look for what's missing, and email me your contribution or ideas on future citation blasts.

http://www.orthopt.org/content/special_interest_groups/performing_arts/citations_endnotes

Special request: One of our Performing Arts SIG members requested citation blast content on gyrotonics and performing arts. Would anyone like to follow-up on this?

Interested in participating in the production of a wellness screen for the young, pre-professional dancer?
contact Brooke Winder, PT, DPT, OCS, brookeRwinder@gmail.com

Best regards,

Annette

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Laura Reising, MS, PT, DPT, lbreising@gmail.com (EndNote Organizer)

PERFORMING ARTS CONTINUING EDUCATION, CONFERENCES, AND RESOURCES

Orthopaedic Section Independent Study Course. *20.3 Physical Therapy for the Performing Artist.*
Monographs are available for:

- Figure Skating (J. Flug, J. Schneider, E. Greenberg),
- Artistic Gymnastics (A. Hunter-Giordano, Pongetti-Angeletti, S. Voelker, TJ Manal), and
- Instrumentalist Musicians (J. Dommerholt, B. Collier).
Contact: Orthopaedic Section at: www.orthopt.org

Orthopaedic Section-American Physical Therapy Association,
Performing Arts SIG
http://www.orthopt.org/content/special_interest_groups/performing_arts
Performing Arts Citations and Endnotes
http://www.orthopt.org/content/special_interest_groups/performing_arts/citations_endnotes

ADAM Center
http://www.adamcenter.net/
Publications:
http://www.adamcenter.net/#!vstc0=publications
Conference abstracts:
http://www.adamcenter.net/#!vstc0=conferences

Dance USA
http://www.danceusa.org/
Research resources:
http://www.danceusa.org/researchresources
Professional Dancer Annual Post-Hire Health Screen:
http://www.danceusa.org/dancerhealth

Dancer Wellness Project
http://www.dancerwellnessproject.com/
Becoming an affiliate:
http://www.dancerwellnessproject.com/Information/BecomeAffiliate.aspx

Harkness Center for Dance Injuries, Hospital for Joint Diseases
http://hjd.med.nyu.edu/harkness/
Continuing education:
http://hjd.med.nyu.edu/harkness/education/healthcare-professionals/continuing-education-courses-cme-and-ceu
Resource papers:
http://hjd.med.nyu.edu/harkness/dance-medicine-resources/resource-papers-and-forms
Links:
http://hjd.med.nyu.edu/harkness/dance-medicine-resources/links
Informative list of common dance injuries:
http://hjd.med.nyu.edu/harkness/patients/common-dance-injuries
Research publications:
http://hjd.med.nyu.edu/harkness/research/research-publications

International Association for Dance Medicine and Science (IADMS)
http://www.iadms.org/
Resource papers:
http://www.iadms.org/displaycommon.cfm?an=1&subarticlenbr=186
Links:
http://www.iadms.org/displaycommon.cfm?an=5
Medicine, arts medicine, and arts education organization links:
http://www.iadms.org/displaycommon.cfm?an=1&subarticlenbr=5
Publications:
http://www.iadms.org/displaycommon.cfm?an=3

Performing Arts Medicine Association (PAMA)
http://www.artsmed.org/
http://www.artsmed.org/symposium.html
Interactive bibliography site:
http://www.artsmed.org/bibliography.html
Related links:
http://www.artsmed.org/relatedlinks.html
Member publications:
http://artsmed.org/publications.html

(Educators, researchers, and clinicians, please continue to email me your conference and continuing education information and I will include it in the upcoming blasts.)

"New Considerations for Performing Arts Physical Therapists in a Direct Access Environment"

Three events occurred for me recently:

1. I was asked to review a very good app on clinical pattern recognition for a journal. I then realized there are few PEDro, Cochrane, Quadas type tools with which to objectively evaluate apps.
2. I had a fall from a ladder and was diagnosed with a moderate concussion with the SCAT 2, and the MD who tested me used the SCAT 2 app from his iPhone...Interesting!
3. I notice the influx of performing artists who want a "wellness check up" while in LA on vacation, willing to pay cash for an evaluation and guidance on how to be better at what they do.

I was prompted to investigate areas involving our care of performing artists in regards to the building of relationship between provider and patient, and recognition

of our expertise as not only rehabilitation specialists, but also as prevention and wellness practitioners. It was interesting to note dancers will likely go to their teacher first, then to the PT, and last to their MD, and how musicians have a keen awareness of issues involving their instrumental refinement but not of other areas in regards to their overall health. All the more reason for us to "know our stuff." In California, we are going to have a modified direct access in January 2014. The burden of excellent differential diagnosis and clinical reasoning should be at the forefront of our continuing education.

I have included general updates on rehabilitation in vocal, instrumental, and dance performing arts, many citations on health issues addressed by apps, critiques, lessons learned, and the call for an evidence-based evaluation of apps. I hope this will start the wheels turning for us as we consider public access to apps, our face in the public as physical therapists and specialists, and how we can move forward in this generation of #something-interesting-to-say#be-quick#cute#bam#pow#!

Annette Karim, PT, DPT, OCS, FAAOMPT
Director of Dance Medicine, Evergreen Physical Therapy Specialists, Pasadena, CA

Abroms, L. C., J. Lee Westmaas, et al. (2013). "A content analysis of popular smartphone apps for smoking cessation." Am J Prev Med **45**(6): 732-736.

BACKGROUND: Smartphone applications (apps) are increasingly available for smoking cessation. PURPOSE: This study examined the content of popular apps for smoking cessation for both iPhone and Android operating systems in February 2012. METHODS: A total of 252 smoking-cessation apps were identified for the iPhone and 148 for the Android. Across both operating systems, the most popular apps were identified (n=47 for the iPhone and n=51 for the Android) and analyzed for their (1) approach to smoking cessation and (2) adherence to an index based on the U.S. Public Health Service's Clinical Practice Guidelines for Treating Tobacco Use and Dependence. Where available, apps were coded for frequency of downloads. The analysis took place in 2012. RESULTS: Overall, popular apps have low levels of adherence, with an average score of 12.9 of a possible 42 on the Adherence Index. No apps recommended calling a quitline, and only a handful of apps recommended using approved medications (4.1%). Android apps in the sample were downloaded worldwide between 310,800 and 1,248,000 times per month. For both the iPhone and Android, user ratings were positively associated with scores on the Adherence Index. For the iPhone, display order was also positively associated with scores on the Adherence Index. CONCLUSIONS: Apps could be improved by better integration with the Clinical Practice Guidelines and other evidence-based practices.

Air, M. E., M. J. Grierson, et al. (2013). "Dissecting the Doctor-Dancer Relationship: Health Care Decision Making Among American Collegiate Dancers." PM R.

OBJECTIVE: To examine perceptual influences on dancers' health care-seeking decisions and whether dancers' beliefs correlate with actual use of provider services when they are injured. Secondary aims were to understand how dancers may select physicians and what they consider to be the most important features of the medical consultation. DESIGN: Prospective cohort study. SETTING: University and conservatory dance departments. PARTICIPANTS: Forty American collegiate dancers. ASSESSMENT OF RISK FACTORS: Before the start of the dance semester, all participants completed a retrospective survey that included baseline demographic data, dance experience, a dance-related injury (DRI) inventory, previous health care exposures, and perceptions regarding health care treatment providers. Data regarding new DRIs and health care exposures were then prospectively collected every 2 weeks for 6 months. MAIN OUTCOME MEASUREMENTS: A DRI was defined as any neuromusculoskeletal condition sustained as the result of dancing activity that caused a dancer to stop or modify his or her dancing for more than 3 consecutive days. RESULTS: Dancers perceived dance teachers to be first-line treatment providers (47.5%), followed by physical therapists (PTs; 30%). Physicians were ranked third (12.5%) and only marginally higher than a dance colleague (10%). The dancers expressed a strong preference for nonsurgical rather than surgical physicians (87.5% versus 5.0%), and among physicians, the majority of dancers preferred subspecialists (60%), namely nonsurgical sports medicine doctors and physiatrists. During the 6-month prospective data-collection period, 25 dancers (69.4%) sustained 55 unique injuries, with 22 dancers (88%) and 34 injuries (61.8%) undergoing evaluation. Only 17.7% of injuries were evaluated by a physician. Dancers showed greater incongruity between their preinjury perceptions and postinjury use of physicians than they did with PTs (P = .0002). CONCLUSIONS: Although dancers did not perceive physicians to be first-line treatment providers for DRIs, these perceptions about physicians were poorly correlated with use. Instead, injured dancers' health care-seeking behaviors were more likely related to relatively decreased barriers to other nonphysician providers, as well as pre-existing referral pathways to PTs.

Arsand, E., D. H. Froisland, et al. (2012). "Mobile health applications to assist patients with diabetes: lessons learned and design implications." J Diabetes Sci Technol **6**(5): 1197-1206.

Self-management is critical to achieving diabetes treatment goals. Mobile phones and Bluetooth(R) can supportself-management and lifestyle

changes for chronic diseases such as diabetes. A mobile health (mHealth) research platform--the Few Touch Application (FTA)--is a tool designed to support the self-management of diabetes. The FTA consists of a mobile phone-based diabetes diary, which can be updated both manually from user input and automatically by wireless data transfer, and which provides personalized decision support for the achievement of personal health goals. Studies and applications (apps) based on FTAs have included: (1) automatic transfer of blood glucose (BG) data; (2) short message service (SMS)-based education for type 1diabetes (T1DM); (3) a diabetes diary for type 2 diabetes (T2DM); (4) integrating a patient diabetes diary with health care (HC) providers; (5) a diabetes diary for T1DM; (6) a food picture diary for T1DM; (7) physical activity monitoring for T2DM; (8) nutrition information for T2DM; (9) context sensitivity in mobile self-help tools; and (10) modeling of BG using mobile phones. We have analyzed the performance of these 10 FTA-based apps to identify lessons for designing the most effective mHealth apps. From each of the 10 apps of FTA, respectively, we conclude: (1) automatic BG data transfer is easy to use and provides reassurance; (2) SMS-based education facilitates parent-child communication in T1DM; (3) the T2DM mobile phone diary encourages reflection; (4) the mobile phone diary enhances discussion between patients and HC professionals; (5) the T1DM mobile phone diary is useful and motivational; (6) the T1DM mobile phone picture diary is useful in identifying treatment obstacles; (7) the step counter with automatic data transfer promotes motivation and increases physical activity in T2DM; (8) food information on a phone for T2DM should not be at a detailed level; (9) context sensitivity has good prospects and is possible to implement on today's phones; and (10) BG modeling on mobile phones is promising for motivated T1DM users. We expect that the following elements will be important in future FTA designs: (A) automatic data transfer when possible; (B) motivational and visual user interfaces; (C) apps with considerable health benefits in relation to the effort required; (D) dynamic usage, e.g., both personal and together with HC personnel, long-/short-term perspective; and (E) inclusion of context sensitivity in apps. We conclude that mHealth apps will empower patients to take a more active role in managing their own health.

Azar, K. M., L. I. Lesser, et al. (2013). "Mobile applications for weight management: theory-based content analysis." Am J Prev Med **45**(5): 583-589.

BACKGROUND: The use of smartphone applications (apps) to assist with weight management is increasingly prevalent, but the quality of these apps is not well characterized. PURPOSE: The goal of the study was to evaluate diet/nutrition and anthropometric tracking apps based on incorporation of features consistent with theories of behavior change. METHODS: A comparative, descriptive assessment was conducted of the

top-rated free apps in the Health and Fitness category available in the iTunes App Store. Health and Fitness apps (N=200) were evaluated using predetermined inclusion/exclusion criteria and categorized based on commonality in functionality, features, and developer description. Four researchers then evaluated the two most popular apps in each category using two instruments: one based on traditional behavioral theory (score range: 0-100) and the other on the Fogg Behavioral Model (score range: 0-6). Data collection and analysis occurred in November 2012. RESULTS: Eligible apps (n=23) were divided into five categories: (1) diet tracking; (2) healthy cooking; (3) weight/anthropometric tracking; (4) grocery decision making; and (5) restaurant decision making. The mean behavioral theory score was 8.1 (SD=4.2); the mean persuasive technology score was 1.9 (SD=1.7). The top-rated app on both scales was Lose It! by Fitnow Inc. CONCLUSIONS: All apps received low overall scores for inclusion of behavioral theory-based strategies.

Becker, S., A. Mitchell, et al. (2012). "[Mobile applications and management of hypertension: possibilities, problems and perspectives]." Herz **37**(7): 742-745.

Via the internet smartphones allow the download of applications ("Apps") that can address various requirements of daily life. These technical advances create new opportunities to better meet needs of patients suffering from hypertension. This may apply particularly for medication adherence, blood pressure control and lifestyle-changing activities. At the moment younger users in particular are interested in such technology. From other clinical contexts it is known that text messages via cell phones improve medication adherence. A combination of a smartphone and a blood pressure measurement device with the possibility to electronically collect data is promising as the quality of data may improve. Technology interventions by mobile applications that are supported by education or an additional intervention demonstrate a beneficial impact for the reduction of physical inactivity and/or overweight and obesity. However, it is not clear what parts of the technology or interventions are effective. For future developments it will be important to reduce costs and better meet hardware and software requirements of elderly users.

Boulos, M. N., S. Wheeler, et al. (2011). "How smartphones are changing the face of mobile and participatory healthcare: an overview, with example from eCAALYX." Biomed Eng Online **10**: 24.

The latest generation of smartphones are increasingly viewed as handheld computers rather than as phones, due to their powerful on-board computing capability, capacious memories, large screens and open operating systems that encourage application development. This paper provides a brief state-of-the-art overview of health and healthcare smartphone apps (applications) on the market today, including emerging

trends and market uptake. Platforms available today include Android, Apple iOS, RIM BlackBerry, Symbian, and Windows (Windows Mobile 6.x and the emerging Windows Phone 7 platform). The paper covers apps targeting both laypersons/patients and healthcare professionals in various scenarios, e.g., health, fitness and lifestyle education and management apps; ambient assisted living apps; continuing professional education tools; and apps for public health surveillance. Among the surveyed apps are those assisting in chronic disease management, whether as standalone apps or part of a BAN (Body Area Network) and remote server configuration. We describe in detail the development of a smartphone app within eCAALYX (Enhanced Complete Ambient Assisted Living Experiment, 2009-2012), an EU-funded project for older people with multiple chronic conditions. The eCAALYX Android smartphone app receives input from a BAN (a patient-wearable smart garment with wireless health sensors) and the GPS (Global Positioning System) location sensor in the smartphone, and communicates over the Internet with a remote server accessible by healthcare professionals who are in charge of the remote monitoring and management of the older patient with multiple chronic conditions. Finally, we briefly discuss barriers to adoption of health and healthcare smartphone apps (e.g., cost, network bandwidth and battery power efficiency, usability, privacy issues, etc.), as well as some workarounds to mitigate those barriers.

Breland, J. Y., V. M. Yeh, et al. (2013). "Adherence to evidence-based guidelines among diabetes self-management apps." Transl Behav Med **3**(3): 277-286.

Smartphone apps can provide real-time, interactive self-management aid to individuals with diabetes. It is currently unclear whether existing diabetes self-management apps follow evidence-based guidelines. The purpose of this study was to evaluate the extent to which existing diabetes self-management apps address the seven self-management behaviors recommended by the American Association of Diabetes Educators (the AADE7). The term "diabetes" identified relevant self-management apps via the Apple App Store search engine in March 2012. Ratings were based on app descriptions and downloads. Chi-square analyses assessed differences in apps based on developer type. Apps promoted a median of two AADE7 skills. Overall reliability between description and download ratings was good (kappa = .66). Reliability of individual skills was variable (kappa = .25 to .91). Most diabetes apps do not conform to evidence-based recommendations, and future app reviews would benefit from testing app performance. Future apps may also benefit from theory-based designs.

Brown, W., 3rd, P. Y. Yen, et al. (2013). "Assessment of the Health IT Usability Evaluation Model (Health-ITUEM) for evaluating mobile health (mHealth)

technology." J Biomed Inform **46**(6): 1080-1087.

BACKGROUND: Over two decades of research has been conducted using mobile devices for health related behaviors yet many of these studies lack rigor. There are few evaluation frameworks for assessing the usability of mHealth, which is critical as the use of this technology proliferates. As the development of interventions using mobile technology increase, future work in this domain necessitates the use of a rigorous usability evaluation framework. METHODS: We used two exemplars to assess the appropriateness of the Health IT Usability Evaluation Model (Health-ITUEM) for evaluating the usability of mHealth technology. In the first exemplar, we conducted 6 focus group sessions to explore adolescents' use of mobile technology for meeting their health Information needs. In the second exemplar, we conducted 4 focus group sessions following an Ecological Momentary Assessment study in which 60 adolescents were given a smartphone with pre-installed health-related applications (apps). DATA ANALYSIS: We coded the focus group data using the 9 concepts of the Health-ITUEM: Error prevention, Completeness, Memorability, Information needs, Flexibility/Customizability, Learnability, Performance speed, Competency, Other outcomes. To develop a finer granularity of analysis, the nine concepts were broken into positive, negative, and neutral codes. A total of 27 codes were created. Two raters (R1 and R2) initially coded all text and a third rater (R3) reconciled coding discordance between raters R1 and R2. RESULTS: A total of 133 codes were applied to Exemplar 1. In Exemplar 2 there were a total of 286 codes applied to 195 excerpts. Performance speed, Other outcomes, and Information needs were among the most frequently occurring codes. CONCLUSION: Our two exemplars demonstrated the appropriateness and usefulness of the Health-ITUEM in evaluating mobile health technology. Further assessment of this framework with other study populations should consider whether Memorability and Error prevention are necessary to include when evaluating mHealth technology.

Cohn, A. M., D. Hunter-Reel, et al. (2011). "Promoting behavior change from alcohol use through mobile technology: the future of ecological momentary assessment." Alcohol Clin Exp Res **35**(12): 2209-2215.

BACKGROUND: Interactive and mobile technologies (i.e., smartphones such as Blackberries, iPhones, and palm-top computers) show promise as an efficacious and cost-effective means of communicating health-behavior risks, improving public health outcomes, and accelerating behavior change. The present study was conducted as a "needs assessment" to examine the current available mobile smartphone applications (e.g., apps) that utilize principles of ecological momentary assessment (EMA)-daily self-monitoring or near real-time self-assessment of alcohol-use behavior-to promote positive behavior change, alcohol harm reduction, psycho-

education about alcohol use, or abstinence from alcohol. METHODS: Data were collected and analyzed from iTunes for Apple iPhone((c)) . An inventory assessed the number of available apps that directly addressed alcohol use and consumption, alcohol treatment, or recovery, and whether these apps incorporated empirically based components of alcohol treatment. RESULTS: Findings showed that few apps addressed alcohol-use behavior change or recovery. Aside from tracking drinking consumption, a minority utilized empirically based components of alcohol treatment. Some apps claimed they could serve as an intervention; however, no empirical evidence was provided. CONCLUSIONS: More studies are needed to examine the efficacy of mobile technology in alcohol intervention studies. The large gap between availability of mobile apps and their use in alcohol treatment programs indicates several important future directions for research.

Cowan, L. T., S. A. Van Wagenen, et al. (2013). "Apps of steel: are exercise apps providing consumers with realistic expectations?: a content analysis of exercise apps for presence of behavior change theory." Health Educ Behav **40**(2): 133-139.

OBJECTIVE: To quantify the presence of health behavior theory constructs in iPhone apps targeting physical activity. METHODS: This study used a content analysis of 127 apps from Apple's (App Store) Health & Fitness category. Coders downloaded the apps and then used an established theory-based instrument to rate each app's inclusion of theoretical constructs from prominent behavior change theories. Five common items were used to measure 20 theoretical constructs, for a total of 100 items. A theory score was calculated for each app. Multiple regression analysis was used to identify factors associated with higher theory scores. RESULTS: Apps were generally observed to be lacking in theoretical content. Theory scores ranged from 1 to 28 on a 100-point scale. The health belief model was the most prevalent theory, accounting for 32% of all constructs. Regression analyses indicated that higher priced apps and apps that addressed a broader activity spectrum were associated with higher total theory scores. CONCLUSION: It is not unexpected that apps contained only minimal theoretical content, given that app developers come from a variety of backgrounds and many are not trained in the application of health behavior theory. The relationship between price and theory score corroborates research indicating that higher quality apps are more expensive. There is an opportunity for health and behavior change experts to partner with app developers to incorporate behavior change theories into the development of apps. These future collaborations between health behavior change experts and app developers could foster apps superior in both theory and programming possibly resulting in better health outcomes.

Curaudeau, G. A., N. Sharma, et al. (2011). "Development of an iPhone application for sideline concussion testing." Neurosurg Focus **31**(5): E4.

Professional athletes are taking concussion very seriously, and missed play due to concussion is no longer stigmatized. One fortuitous consequence is increased awareness of the detrimental effects of concussion among student athletes. Whereas professional athletes have access to formal in-competition evaluation and out-of-competition monitoring programs, the majority of student athletes, especially at the middle school and high school levels, do not. The authors therefore set out to create an easy-to-use iPhone application for sideline concussion testing and serial monitoring of these at-risk athletes.

Dayer, L., S. Heldenbrand, et al. (2013). "Smartphone medication adherence apps: potential benefits to patients and providers." J Am Pharm Assoc (2003) **53**(2): 172-181.

OBJECTIVES: To provide an overview of medication adherence, discuss the potential for smartphone medication adherence applications (adherence apps) to improve medication nonadherence, evaluate features of adherence apps across operating systems (OSs), and identify future opportunities and barriers facing adherence apps. PRACTICE DESCRIPTION: Medication nonadherence is a common, complex, and costly problem that contributes to poor treatment outcomes and consumes health care resources. Nonadherence is difficult to measure precisely, and interventions to mitigate it have been largely unsuccessful. PRACTICE INNOVATION: Using smartphone adherence apps represents a novel approach to improving adherence. This readily available technology offers many features that can be designed to help patients and health care providers improve medication-taking behavior. MAIN OUTCOME MEASURES: Currently available apps were identified from the three main smartphone OSs (Apple, Android, and Blackberry). In addition, desirable features for adherence apps were identified and ranked by perceived importance to user desirability using a three-point rating system: 1, modest; 2, moderate; or 3, high. The 10 highest-rated apps were installed and subjected to user testing to assess app attributes using a standard medication regimen. RESULTS 160 adherence apps were identified and ranked. These apps were most prevalent for the Android OS. Adherence apps with advanced functionality were more prevalent on the Apple iPhone OS. Among all apps, MyMedSchedule, MyMeds, and RxmindMe rated the highest because of their basic medication reminder features coupled with their enhanced levels of functionality. CONCLUSION: Despite being untested, medication apps represent a possible strategy that pharmacists can recommend to nonadherent patients and incorporate into their practice.

Dennison, L., L. Morrison, et al. (2013). "Opportunities and challenges for smartphone applications in supporting health behavior change: qualitative study." J Med Internet Res **15**(4): e86.

BACKGROUND: There is increasing interest from academics and clinicians in harnessing smartphone applications (apps) as a means of delivering behavioral interventions for health. Despite the growing availability of a range of health-related apps on the market, academic research on the development and evaluation of such apps is in the relatively early stages. A few existing studies have explored the views of various populations on using mobile phones for health-related issues and some studies are beginning to report user feedback on specific apps. However, there remains little in depth research on users' (and potential users') experiences and views on a wide range of features and technologies that apps are, or will soon be, capable of. In particular, research on young adults is lacking, which is an unfortunate omission considering that this group comprises of a good number of mobile technology adoptors. OBJECTIVE: The current study sought to explore young adults' perspectives on apps related to health behavior change. It sought their experiences and views of features that might support health behavior change and issues that contribute to interest in and willingness to use such apps. METHODS: Four focus groups were conducted with 19 students and staff at a University in the United Kingdom. Participants included 13 females and 6 males with a mean age of 23.79 (SD 7.89). The focus group discussions centred on participants' experiences of using smartphone apps to support a healthy lifestyle, and their interest in and feelings about features and capabilities of such apps. The focus groups were recorded, transcribed, and analyzed using inductive thematic analysis. RESULTS: Study findings suggested that young, currently healthy adults have some interest in apps that attempt to support health-related behavior change. Accuracy and legitimacy, security, effort required, and immediate effects on mood emerged as important influences on app usage. The ability to record and track behavior and goals and the ability to acquire advice and information "on the go" were valued. Context-sensing capabilities and social media features tended to be considered unnecessary and off-putting. CONCLUSIONS: This study provided insight into the opportunities and challenges involved in delivering health-related behavioral interventions through smartphone apps. The findings suggested a number of valued features and characteristics that app developers may wish to consider when creating health behavior apps. Findings also highlighted several major challenges that appeared to need further consideration and research to ensure the development of effective and well-accepted behavior change apps.

Dommerholt, J. (2009). "Performing arts medicine - instrumentalist musicians part I - general considerations." J Bodyw Mov Ther **13**(4): 311-319.

Performing arts medicine is a relatively new specialty addressing the medical needs of dancers, musicians, ice skaters, and gymnasts. This paper focuses on the role of healthcare providers in the diagnosis and therapeutic management of instrumentalist musicians. Musicians are at high risk for developing painful musculoskeletal problems, including pain and overuse injuries, entrapment and peripheral neuropathies, and focal dystonias. Musicians' careers are threatened, when they are no longer able to play their instrument because of pain and dysfunction. To appreciate music-related injuries, it is important that clinicians are familiar with the context of musicians' injuries and disorders. This is the first paper in a series of three. This paper discusses the importance of taking an extended history. The typical history procedures need to be broadened when interviewing musicians, and should include instrument-specific questions, and questions regarding practice habits, education, repertoire, and employment. The second article addresses the physical examination, while the third article provides three case reports of musicians with hand problems, which serve to illustrate the points made in the first two articles. The articles are illustrated with several tables and photographs of musicians to assist the reader in assessing instrumentalist musicians and determining the most appropriate course of action.

Dommerholt, J. (2010). "Performing arts medicine - instrumentalist musicians: part III - case histories." J Bodyw Mov Ther **14**(2): 127-138.

In parts I and II of this article series, the basic principles of examining musicians in a healthcare setting were reviewed [Dommerholt, J. Performing arts medicine - instrumentalist musicians: part I: general considerations. J. Bodyw. Mov. Ther., in press-a; Dommerholt, J. Performing arts medicine - instrumentalist musicians: part II: the examination. J. Bodyw. Mov. Ther., in press-b]. Part III describes three case reports of musicians with hand pain, interfering with their ability to play their instruments. The musicians consulted with a performing arts physiotherapist. Neither musician had a correct medical diagnosis if at all, when they first contacted the physiotherapist. Each musician required an individualized approach not only to establish the correct diagnosis, but also to develop a specific treatment program. The treatment programs included ergonomic interventions, manual therapy, trigger point therapy, and patient education. All musicians returned to playing their instruments without any residual pain or dysfunction.

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musicians in a healthcare setting were reviewed [Dommerholt, J. Performing arts medicine - instrumentalist musicians: part I: general considerations. J. Bodyw. Mov. Ther., in press-a; Dommerholt, J. Performing arts medicine - instrumentalist musicians: part II: the examination. J. Bodyw. Mov. Ther., in press-b]. Part III describes three case reports of musicians with hand pain, interfering with their ability to play their instruments. The musicians consulted with a performing arts physiotherapist. Neither musician had a correct medical diagnosis if at all, when they first contacted the physiotherapist. Each musician required an individualized approach not only to establish the correct diagnosis, but also to develop a specific treatment program. The treatment programs included ergonomic interventions, manual therapy, trigger point therapy, and patient education. All musicians returned to playing their instruments without any residual pain or dysfunction.

Franko, O. I. and T. F. Tirrell (2012). "Smartphone app use among medical providers in ACGME training programs." J Med Syst **36**(5): 3135-3139.

The past decade has witnessed the advent of the smartphone, a device armed with computing power, mobility and downloadable "apps," that has become commonplace within the medical field as both a personal and professional tool. The popularity of medically-related apps suggests that physicians use mobile technology to assist with clinical decision making, yet usage patterns have never been quantified. A digital survey examining smartphone and associated app usage was administered via email to all ACGME training programs. Data regarding respondent specialty, level of training, use of smartphones, use of smartphone apps, desired apps, and commonly used apps were collected and analyzed. Greater than 85% of respondents used a smartphone, of which the iPhone was the most popular (56%). Over half of the respondents reported using apps in their clinical practice; the most commonly used app types were drug guides (79%), medical calculators (18%), coding and billing apps (4%) and pregnancy wheels (4%). The most frequently requested app types were textbook/reference materials (average response: 55%), classification/treatment algorithms (46%) and general medical knowledge (43%). The clinical use of smartphones and apps will likely continue to increase, and we have demonstrated an absence of high-quality and popular apps despite a strong desire among physicians and trainees. This information should be used to guide the development of future healthcare delivery systems; expanded app functionality is almost certain but reliability and ease of use will likely remain major factors in determining the successful integration of apps into clinical practice.

Froisland, D. H., E. Arsand, et al. (2012). "Improving diabetes care for young people with type 1 diabetes through visual learning on mobile phones: mixed-

methods study." J Med Internet Res **14**(4): e111.

BACKGROUND: Only 17% of Norwegian children and adolescents with diabetes achieve international treatment goals measured by glycated hemoglobin (HbA(1c)). Classic patient-physician consultations seem to be poorly adapted to young children. New strategies that are better attuned to young people to improve support of adolescents' self-management of diabetes need to be tested and evaluated. OBJECTIVE: (1) To explore how applications for mobile phones can be used in follow-up of adolescents with type 1 diabetes, and (2) to use the findings to guide further development of the applications and as a basis for future studies. METHOD: We pilot tested two mobile phone applications: (1) an application that contained a picture-based diabetes diary to record physical activity and photos taken with the phone camera of food eaten, where the phone also communicated with the glucometer by Bluetooth technology to capture blood glucose values, and (2) a Web-based, password-secured and encrypted short message service (SMS), based on access using login passwords received via SMS to be used by participants to send messages to their providers when they faced obstacles in everyday life, and to send educational messages to the participants. At the end of the 3-month pilot study, 12 participants (7 girls and 5 boys) aged 13-19 years completed semistructured interviews. The participants had a mean HbA(1c)value of 8.3 (SD 0.3), mean age of 16.2 (SD 1.7) years, mean body mass index of 23.3 (SD 3.2) kg/m(2), and mean diabetes duration of 7.5 (SD 4.6) years. We applied three additional measurements: change in metabolic control as measured by HbA(1c), the System Usability Scale, and diabetes knowledge. RESULTS: From the interviews, three main categories emerged: visualization, access, and software changes. Participants appreciated the picture-based diary more than the SMS solution. Visualization of cornerstones in diabetes self-care (ie, diet, insulin dosage, physical activity, and pre- and postprandial glucose measurements all transformed into one picture) in the mobile diary was found to be an important educational tool through reflections in action. This led to a change in participants' applied knowledge about the management of their disease. Additional measurements supplemented and supported the qualitative findings. However, changes in HbA(1c)and participants' theoretical knowledge as tested by a 27-item questionnaire, based on a national health informatics' diabetes quiz, before and after the intervention were not statistically significant (P = .38 and P = .82, respectively, paired-samples t test). Participants suggested additional functionality, and we will implement this in the design of the next software generation. CONCLUSION: Participants reported an increased understanding of applied knowledge, which seem to positively affect diabetes self-care. Visual impressions seem well adapted to the maturation of the adolescent brain, facilitating the link between theoretical

knowledge and executive functions. SMS gave the adolescents a feeling of increased access and security. Participants gave valuable input for further development of these applications.

Gay, V. and P. Leijdekkers (2012). "Personalised mobile health and fitness apps: lessons learned from myFitnessCompanion(R)." Stud Health Technol Inform **177**: 248-253.

Smartphones and tablets are slowly but steadily changing the way we look after our health and fitness. Today, many high quality mobile apps are available for users and health professionals and cover the whole health care chain, i.e. information collection, prevention, diagnosis, treatment and monitoring. Our team has developed a mobile health and fitness app called myFitnessCompanion(R) which has been available via Android market since February 2011. The objective of this paper is to share our experience with rolling out a mobile health and fitness app. We discuss the acceptance of health apps by end-users and healthcare industry. We discuss how mobile health apps will be distributed in the near future, the use of Personal Health Record (PHR) systems such as Microsoft HealthVault and the impact of regulations (FDA) on the future of mobile health apps. The paper is based on seven years of experience by the authors as mobile health and fitness application developers and we discuss the challenges and opportunities for app developers in the health industry.

Goulart, B. N. and J. R. Vilanova (2011). "Professional theatre actors: environmental and socio-occupational use of voice." J Soc Bras Fonoaudiol **23**(3): 271-276.

PURPOSE: To investigate the occurrence of vocal complaints and symptoms among professional theatre actors, and its relationship with environmental aspects of this professional activity and with the history of specialized intervention. METHODS: Cross-sectional study with 48 professional actors who answered a questionnaire regarding vocal and extra-vocal complaints, as well as environmental aspects, habits and demands related to their professional activity in the theatre. A specific previously structured protocol (PROTEA) was used for this purpose. RESULTS: Previous history of acting vocal training was reported by 40 (83.3%) subjects. The most used resources were vocal warming, hydrating therapy, and alternative methods. Vocal difficulties in day-to-day demands were reported by 14 (35.0%) subjects, and eight (16.7%) of them noticed these difficulties since the beginning of their career. During performances, 14 (29.2%) reported difficulties coordinating breathing and speaking. All actors interviewed consider vocal health important for theatre acting. Most actors denied difficulties regarding vocal projection, breathing and/or articulation of words in scene. However, the Italian stage seems to

be more related to difficulties coordinating breathing and speaking than the arena theater (p=0.00). CONCLUSION: In spite of professional actors who have a history of training and orientation regarding the use of professional voice, a significant portion of them have complaints related to professional voice use, especially associated to the environment conditions at work.

Guptill, C. (2008). "Musicians' health: applying the ICF framework in research." Disabil Rehabil **30**(12-13): 970-977.

PURPOSE: Injuries described as 'playing-related' in musicians have a prevalence rate of up to 87%. Nevertheless, healthcare consultation rates among this population remain low. Using the theoretical framework of the World Health Organization's International Classification of Functioning, Disability and Health (ICF), the author examined the musicians' health literature to determine potential causes for the shortcomings in the provision of evidence-based treatment for injured musicians. METHOD: A review of the literature on musicians' health was performed from 1998 to December 2005. In total, 131 papers were reviewed. RESULTS: Much of the literature on musicians' health is related to the domain of Body Structure and Function within the ICF framework. However, even in these relatively well-defined areas, clinicians appear to agree that the 'best treatment' depends enormously on the interplay of biopsychosocial factors and on the musician's context. Underrepresented areas in the literature include Environmental Factors, Personal Factors, and the domain of Participation. CONCLUSIONS: This review demonstrates a lack of research in some health and health-related domains in the musicians' health literature. The author suggests that these underrepresented areas within the ICF framework may explain shortcomings in the availability of effective, evidence-based treatment for musicians. The use of a framework to shape future research in this field is advocated.

Hebden, L., A. Cook, et al. (2012). "Development of smartphone applications for nutrition and physical activity behavior change." JMIR Res Protoc **1**(2): e9.

BACKGROUND: Young adults (aged 18 to 35) are a population group at high risk for weight gain, yet we know little about how to intervene in this group. Easy access to treatment and support with self-monitoring of their behaviors may be important. Smartphones are gaining in popularity with this population group and software applications ("apps") used on these mobile devices are a novel technology that can be used to deliver brief health behavior change interventions directly to individuals en masse, with potentially favorable cost-utility. However, existing apps for modifying nutrition or physical activity behaviors may not always reflect best practice guidelines for weight management. OBJECTIVE: This paper describes the process of developing four apps aimed at modifying key lifestyle behaviors

associated with weight gain during young adulthood, including physical activity, and consumption of take-out foods (fast food), fruit and vegetables, and sugar-sweetened drinks. METHODS: The development process involved: (1) deciding on the behavior change strategies, relevant guidelines, graphic design, and potential data collection; (2) selecting the platform (Web-based versus native); (3) creating the design, which required decisions about the user interface, architecture of the relational database, and programming code; and (4) testing the prototype versions with the target audience (young adults aged 18 to 35). RESULTS: The four apps took 18 months to develop, involving the fields of marketing, nutrition and dietetics, physical activity, and information technology. Ten subjects provided qualitative feedback about using the apps. The slow running speed of the apps (due to a reliance on an active Internet connection) was the primary issue identified by this group, as well as the requirement to log in to the apps. CONCLUSIONS: Smartphone apps may be an innovative medium for delivering individual health behavior change intervention en masse, but researchers must give consideration to the target population, available technologies, existing commercial apps, and the possibility that their use will be irregular and short-lived.

Ho, C. L., Y. C. Fu, et al. (2013). "Smartphone Applications (Apps) for Heart Rate Measurement in Children: Comparison with Electrocardiography Monitor." Pediatr Cardiol.

Heart rate (HR) measurement is essential for children with abnormal heart beats. The purpose of this study was to determine whether HR measurement by smartphone applications (apps) could be a feasible alternative to an electrocardiography (ECG) monitor. A total of 40 children, median age of 4.3 years, were studied. Using four free smartphone apps, pulse rates were measured at the finger (or toe) and earlobe, and compared with baseline HRs measured by ECG monitors. Significant correlations between measured pulse rates and baseline HRs were found. Both correlation and accuracy rate were higher in the earlobe group than the finger/toe group. When HR was <120 beats per min (bpm), the accuracy rates were not different between the two different measuring sites for each app (median of 65 vs 76 %). The accuracy rates in the finger/toe group were significantly lower than those in the earlobe group for all apps when HR was >/=120 bpm (27 vs 65 %). There were differences among apps in their abilities to measure pulse rates. Taking children's pulse rate from the earlobe would be more accurate, especially for tachycardia. However, we do not recommend that smartphone apps should not be used for routine medical use or used as the sole form of HR measurement because the results of their accuracy are not good enough.

Hoppmann, R. A. (2001). "Instrumental musicians' hazards." Occup Med **16**(4):

619-631, iv-v.

In the last two decades, injuries to instrumental musicians have been well documented. Major categories of performance-related injuries include musculoskeletal overuse, nerve entrapment/thoracic outlet syndrome, and focal dystonia. Other areas of concern to instrumentalists include hypermobility, osteoarthritis, fibromyalgia, and hearing loss. This chapter reviews the epidemiology, risk factors, physical exam, treatment, and prevention of common problems of instrumentalists. Emphasis is placed on the team approach of treatment and prevention and the need for close collaboration of the various health professionals, music educators, and performers. Additional resources are presented for those interested in pursuing performing arts medicine in greater detail.

Jinguji, T. M., V. Bompadre, et al. (2012). "Sport Concussion Assessment Tool-2: baseline values for high school athletes." Br J Sports Med **46**(5): 365-370.

BACKGROUND: Concussion head injuries are common in high school athletes. The Sport Concussion Assessment Tool-2 (SCAT2) has been recommended and widely adopted as a standardised method of evaluating an injured athlete with a suspected concussion. Sideline return to play decisions can hinge on the results of a SCAT2 score. However, most athletes will not have had baseline testing performed for comparison if injury occurs. Therefore, establishing of age-, sex- and sport-matched normative data for the high school athlete population is critical. PURPOSE: To determine baseline scores in all SCAT2 domains among high school athletes with no prior history of a concussion and to examine subgroup differences for girls and boys, age and sport to establish normative ranges. MATERIALS AND METHODS: The SCAT2 was administered to 214 high school athletes (155 males and 59 females) who participated in football, women's soccer, men's basketball, gymnastics, baseball, softball and track with no prior history of concussion. There were 111 athletes in the 13-15-year-old cohort and 103 in the 16-19-year-old group with a mean age of 15.7 years of age. In all SCAT2 domains the mean and SD of the results were determined. The domains were analysed using age, sex and sport as covariates. Component parts of the cognitive (concentration) domain (digit sequencing and months of year in reverse order) were also analysed by age, sex and sport. The percentage of high school athletes able to perform each digit-sequencing test was calculated as was the percentage of participants who could recite the months of the year in reverse order. RESULTS: The average SCAT2 score for these high school athletes was 89 of a possible 100 with a SD of 6 units. Athletes reported two or three symptoms at baseline with older students reporting more symptoms than younger ones. The average balance score was 25.82 (of 30), and all athletes were able to complete the double-leg stance. Females scored significantly higher on the balance, immediate

memory and concentration scores. Concentration scores in non-concussed high school athletes were low. Only 67% of high school athletes could recite the months of the year backward and only 41% could correctly sequence 5 digits backward. Only 55% of high school football players could correctly recite the months of the year backward and 32% could sequence 5 digits. CONCLUSIONS: Non-concussed high school athletes scored near the total possible in most domains of the SCAT2 with the exception of concentration testing and balance testing. All athletes were able to complete the double-leg stance at baseline; however, there was significant variability of tandem and single-leg stance. Baseline testing is important when considering balance tests. Concentration testing in high school athletes is unreliable because of high baseline error and is likely to result in a high rate of false positives and false negatives. Return to play decisions should not rely on concentration testing without a baseline test for comparison.

Lai, R. Y., D. Krasnow, et al. (2008). "Communication between medical practitioners and dancers." J Dance Med Sci **12**(2): 47-53.

The purpose of this study was to investigate patterns of communication between professional and pre-professional dancers and medical practitioners. One survey was developed and randomly conducted among family physicians, sports medicine physicians, chiropractors, physical therapists, and registered massage therapists. A second survey involved volunteer ballet and modern dancers in professional dance training programs, college and university dance programs, and independent dance artists. One hundred and ninety questionnaires were distributed to medical practitioners, and 50 were returned. Of 380 questionnaires given to dancers, 202 were returned. The dancers were 18 to 49 years old, with a majority between the ages of 18 and 20. They averaged more than 10 years of dance training. All of the questionnaires were distributed in a single large Canadian city. The data shows that medical practitioners rarely communicated with each other concerning a common (dance) patient. They also failed to communicate, in most cases, with the dancers' teachers, choreographers, and directors. This was not disconcerting to injured dancers, who tended to believe that such communication was not important to their recovery. Significantly, dancers did not fully understand the nature of their injuries when they sought medical advice, and they did not press the medical practitioners for additional information. Both groups generally believed that dancers would benefit by learning more about human anatomy.

Liederbach, M. (2010). "Perspectives on dance science rehabilitation understanding whole body mechanics and four key principles of motor control as a basis for healthy movement." J Dance Med Sci **14**(3): 114-124.

This article reviews selected issues of importance in the evaluation, treatment, and reconditioning of dancers during and following injury and offers some insights on injury prevention. The athletic training practice domains of prevention, clinical evaluation and diagnosis, treatment, and rehabilitation and reconditioning within the context of dance medicine are the general focus. In particular, issues relating to the rehabilitation of dancers are presented as they reflect the reasonable, objective practices of the health care profession.

Miller, C. (2006). "Dance medicine: current concepts." Phys Med Rehabil Clin N Am **17**(4): 803-811, vii.

Dance medicine has grown exponentially over the past 10 to 15 years and continues to grow every year as more former professional dancers and students of dance enter into the field of medicine. Dance medicine is part of the field of performing arts medicine, which specializes in evaluating and treating performing artists such as musicians, dancers, actors/actresses, and vocalists. This article reviews the literature on dance medicine for various health-related medical issues, for the types of injuries commonly found, for the common surgical and rehabilitation interventions, and for injury prevention used in this unique group of patients.

Moore, C. (2012). "Reflections on clinical applications of yoga in voice therapy with MTD." Logoped Phoniatr Vocol **37**(4): 144-150.

This paper explores the application of modified yoga techniques, as an adjunct to voice therapy, by a speech pathologist who is also a yoga teacher. Yoga practices, with effects that may be short-term, are not considered a substitute for comprehensive and integrated somatic retraining systems (such as the Alexander Technique or Feldenkrais ATM). However, when yoga is conducted emphasizing kinaesthetic and proprioceptive awareness, the client may achieve an 'awareness state' that facilitates the learning of vocal remediation techniques (for example, by more easily 'tuning in' to the subtle sensations of supralaryngeal deconstriction). Core yoga elements and clinical applications are identified. The potential benefits and considerations when using yoga as an adjunct to the treatment of muscle tension dysphonia (MTD) are explored.

Mosa, A. S., I. Yoo, et al. (2012). "A systematic review of healthcare applications for smartphones." BMC Med Inform Decis Mak **12**: 67.

BACKGROUND: Advanced mobile communications and portable computation are now combined in handheld devices called "smartphones", which are also capable of running third-party software. The number of smartphone users is growing rapidly, including among healthcare professionals. The purpose of this study was to classify smartphone-

based healthcare technologies as discussed in academic literature according to their functionalities, and summarize articles in each category. METHODS: In April 2011, MEDLINE was searched to identify articles that discussed the design, development, evaluation, or use of smartphone-based software for healthcare professionals, medical or nursing students, or patients. A total of 55 articles discussing 83 applications were selected for this study from 2,894 articles initially obtained from the MEDLINE searches. RESULTS: A total of 83 applications were documented: 57 applications for healthcare professionals focusing on disease diagnosis (21), drug reference (6), medical calculators (8), literature search (6), clinical communication (3), Hospital Information System (HIS) client applications (4), medical training (2) and general healthcare applications (7); 11 applications for medical or nursing students focusing on medical education; and 15 applications for patients focusing on disease management with chronic illness (6), ENT-related (4), fall-related (3), and two other conditions (2). The disease diagnosis, drug reference, and medical calculator applications were reported as most useful by healthcare professionals and medical or nursing students. CONCLUSIONS: Many medical applications for smartphones have been developed and widely used by health professionals and patients. The use of smartphones is getting more attention in healthcare day by day. Medical applications make smartphones useful tools in the practice of evidence-based medicine at the point of care, in addition to their use in mobile clinical communication. Also, smartphones can play a very important role in patient education, disease self-management, and remote monitoring of patients.

Muessig, K. E., E. C. Pike, et al. (2013). "Mobile phone applications for the care and prevention of HIV and other sexually transmitted diseases: a review." J Med Internet Res **15**(1): e1.

BACKGROUND: Mobile phone applications (apps) provide a new platform for delivering tailored human immunodeficiency virus (HIV) and sexually transmitted disease (STD) prevention and care. OBJECTIVE: To identify and evaluate currently available mobile phone apps related to the prevention and care of HIV and other STDs. METHODS: We searched the Apple iTunes and Android Google Play stores for HIV/STD-related apps, excluding apps that exclusively targeted industry, providers, and researchers. Each eligible app was downloaded, tested, and assessed for user ratings and functionality as well as 6 broad content areas of HIV prevention and care: HIV/STD disease knowledge, risk reduction/safer sex, condom promotion, HIV/STD testing information, resources for HIV-positive persons, and focus on key populations. RESULTS: Search queries up to May 2012 identified 1937 apps. Of these, 55 unique apps met the inclusion criteria (12 for Android, 29 for iPhone, and 14 for both

platforms). Among these apps, 71% provided disease information about HIV/STDs, 36% provided HIV/STD testing information or resources, 29% included information about condom use or assistance locating condoms, and 24% promoted safer sex. Only 6 apps (11%) covered all 4 of these prevention areas. Eight apps (15%) provided tools or resources specifically for HIV/STD positive persons. Ten apps included information for a range of sexual orientations, 9 apps appeared to be designed for racially/ethnically diverse audiences, and 15 apps featured interactive components. Apps were infrequently downloaded (median 100-500 downloads) and not highly rated (average customer rating 3.7 out of 5 stars). CONCLUSIONS: Most available HIV/STD apps have failed to attract user attention and positive reviews. Public health practitioners should work with app developers to incorporate elements of evidence-based interventions for risk reduction and improve app inclusiveness and interactivity.

Murfin, M. (2013). "Know your apps: an evidence-based approach to evaluation of mobile clinical applications." J Physician Assist Educ **24**(3): 38-40.

Medical smartphone applications (apps) are becoming common as point-of-care references for health professionals and students. There is currently no regulation of the information that is included in the apps or guidelines for recommended use. Judicious review of apps by the user is important before using the information to make treatment-related decisions or as a learning tool in didactic and clinical education.

Nadler, S. F., L. H. Chou, et al. (2004). "Sports and performing arts medicine. 1. General considerations for sports and performing arts medicine." Arch Phys Med Rehabil **85**(3 Suppl 1): S48-51.

This self-directed learning module highlights general considerations in sports and performing arts medicine. It is part of the study guide on sports and performing arts medicine in the Self-Directed Physiatric Education Program for practitioners and trainees in physical medicine and rehabilitation. OVERALL ARTICLE OBJECTIVE: To discuss similarities and differences of injuries sustained in sports and performing arts using case vignettes.

O'Connor, P., D. Byrne, et al. (2013). "Interns and their smartphones: use for clinical practice." Postgrad Med J.

PURPOSE OF THE STUDY: Smartphone use among healthcare professionals has become widespread and will continue to grow in the coming years. STUDY DESIGN: In October 2012, a survey was distributed to 230 interns at two of the national intern training networks in the Republic of Ireland, asking how they used smartphones to carry out their clinical work. RESULTS: It was found that out of 108 interns (47.0% response rate, 108/230), 94.4% (102/108) owned a smartphone. Of those

respondents who owned a smartphone, on at least a daily basis for the purposes of work, 83.3% (85/102) made or received phone calls, 87.2% (89/102) sent or received texts, and 41.2% (42/102) sent or received emails on their smartphone. A total of 52.9% (54/102) had used their smartphone to take a work related picture. The most commonly used app was the British National Formulary. It was used daily by 30.4% (31/102) of respondents with a smartphone. The most commonly used website was Wikipedia. It was accessed at least weekly by 38.2% (39/102) of respondents with a smartphone. CONCLUSIONS: Smartphones are used by the majority of interns on a daily basis in order to perform their job. As such, there is a need for guidance on how patient information can be safely secured and transmitted using smartphones, their appropriate use, and any restrictions on the use of these devices in certain clinical settings. For interns in particular, advice is needed on the credibility of medical apps and websites.

Palac, J. A. and D. N. Grimshaw (2006). "Music education and performing arts medicine: the state of the alliance." Phys Med Rehabil Clin N Am **17**(4): 877-891, viii.

As a group, musicians tend to be somewhat disembodied; their awareness of their whole selves extends almost exclusively to the parts involved directly with musical technique. Even though many consider musicians to be small muscle athletes, it is unusual to see a group of beginning musicians working out or warming up on their practice field, or having a trainer present to supervise their movements or their mental performance orientation, as one would in sports. Several questions come to mind. How has this state of things come about? What do musicians know about the mental, spiritual, and physical attributes they bring to music making? What do music teachers teach students about wellness? How can a collaboration of the fields of music education and rehabilitation medicine approach these issues? This article addresses these questions.

Rodriguez-Lozano, F. J., M. R. Saez-Yuguero, et al. (2011). "Orofacial problems in musicians: a review of the literature." Med Probl Perform Art **26**(3): 150-156.

OBJECTIVE: The objective of our study was to review the different pathologies of the stomatognathic system that can present in musicians as a result of playing their instruments. DESIGN: The National Library of Medicine's PubMed database was searched to identify all peer-reviewed articles in the English literature dealing with orofacial problems in musicians, using both subject headings such as MeSH terms (PubMed) and free text words in combination (oral, musician, violin, wind instruments, vocalists, orthodontic, tooth, temporomandibular disorders [TMD]). The identified studies were assessed independently by two authors. We included any instruments that involved the orofacial area: i.e., wind and brass instruments, vocalists, and violins and violas. RESULTS:

Thirty-two articles were selected that were of many different types (clinical reviews, longitudinal and transverse studies of therapeutic procedures, case-control studies). Among orofacial problems, the most common disorders that affect musicians are TMDs, herpes simplex virus infections, orthodontic problems, and problems with perioral musculature. CONCLUSIONS: Musicians may suffer from pathological conditions that are worsened by their occupation due to excessive practice and stress. These conditions can cause permanent injuries that subsequently prevent the musicians from playing. Depending on the characteristics of the musical instrument and the way it is played, professional musicians generally show a propensity for buccodental problems.

Rosser, B. A. and C. Eccleston (2011). "Smartphone applications for pain management." J Telemed Telecare **17**(6): 308-312.

Smartphone applications (or apps) are becoming increasingly popular. The lack of regulation or guidance for health-related apps means that the validity and reliability of their content is unknown. We have conducted a review of available apps relating to the generic condition of pain. The official application stores for five major smartphone platforms were searched: iPhone, Android, Blackberry, Nokia/Symbian and Windows Mobile. Apps were included if they reported a focus on pain education, management or relief, and were not solely aimed at health-care professionals (HCPs). A total of 111 apps met the inclusion criteria. The majority of apps reviewed claimed some information provision or electronic manual component. Diary tracking of pain variables was also a common feature. There was a low level of stated HCP involvement in app development and content. Despite an increasing number of apps being released, the frequency of HCP involvement is not increasing. Pain apps appear to be able to promise pain relief without any concern for the effectiveness of the product, or for possible adverse effects of product use. In a population often desperate for a solution to distressing and debilitating pain conditions, there is considerable risk of individuals being misled.

Sabo, M. (2013). "Physical therapy rehabilitation strategies for dancers: a qualitative study." J Dance Med Sci **17**(1): 11-17.

This was a qualitative study utilizing a phenomenological approach. The purpose was to determine what rehabilitation strategies physical therapists use with dancers and to discuss techniques for implementing these strategies from both the dancer's and the physical therapist's perspectives. Self-administered questionnaires were sent via email to dancers and physical therapists. Purposeful sampling was done through use of a criterion sampling method that required participants to have experienced dancer rehabilitation. Data were correlated to find common strategies and to encourage modification of current approaches. Physical

therapists returned 29 surveys, while dancers returned eight. Five themes were identified in the areas of: 1. evaluation, 2. dance modification, 3. interventions, 4. education, and 5. communication. The conclusion of this study was that successful rehabilitative strategies involve ongoing evaluation that incorporates knowledge of dance technique and performance, dance-centered movement modification that is clearly defined, and an understanding of dance lingo.

Savic, M., D. Best, et al. (2013). "Exploring the focus and experiences of smartphone applications for addiction recovery." J Addict Dis **32**(3): 310-319.

Addiction recovery Smartphone applications (apps) (n = 87) identified on the Google Play store in 2012 were coded, along with app user reviews, to explore functions, foci, and user experiences. Content analysis revealed that apps typically provided information on recovery, as well as content to enhance motivation, promote social support and tools to monitor progress. App users commented that the apps helped to inform them, keep them focussed, inspire them, and connect them with other people and groups. Because few addiction recovery apps appear to have been formally evaluated, further research is needed to ascertain their effectiveness as stand-alone or adjunctive interventions.

Shoup, D. (2006). "An osteopathic approach to performing arts medicine." Phys Med Rehabil Clin N Am **17**(4): 853-864, viii.

An osteopathic approach to the performing artist is a complete approach. It involves spending adequate time with the performing artist to obtain a complete history and evaluation. It requires attention to the performer's lifestyle, practice habits, exercise routine, nutrition, stress level, and coexisting medical problems. Because an injury to a performing artist can be physically, emotionally, and financially devastating, these patients deserve a comprehensive treatment plan to allow for the best opportunity for recovery.

Toledo, S. D., V. Akuthota, et al. (2004). "Sports and performing arts medicine. 6. Issues relating to dancers." Arch Phys Med Rehabil **85**(3 Suppl 1): S75-78.

This self-directed study module highlights biomechanics unique to dance that predispose to common injuries of the lower extremity and discusses preventative strategies. It is part of the study guide on sports and performing arts medicine in the Self-Directed Physiatric Education Program for practitioners and trainees in physical medicine and rehabilitation. OVERALL ARTICLE OBJECTIVE: To summarize lower-limb and back injuries commonly seen in dancers.

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